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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,573	02/21/2007	Patrick Walter Joseph Dijkstra	12114.0004USWO	1704

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EXAMINER	
HU, JENNIFER F	

ART UNIT	PAPER NUMBER
2821	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/582,573	DIJKSTRA, PATRICK WALTER JOSEPH	
	Examiner	Art Unit	
	JENNIFER F. HU	2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 October 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Amendment A received on October 21, 2009 has been entered into the record.

2. Claims 1-4 and 6-16 are pending.

Response to Arguments

3. Applicant's arguments filed October 21, 2009 have been fully considered but they are not persuasive. Applicant argues on page 6, in the first paragraph that the conductor 6 extends all the way through Sekine's dielectric 14 and is connected with metal pattern 10 on a different circuit substrate 3, and therefore cannot be considered to be "against the antenna substrate". However, it is noted that there is no mention of "an antenna substrate" in claim 1, but rather an antenna plate, wherein the metal passage passes through the antenna plate and transposes into a bond pad against the antenna plate. The Office Action refers to reference numeral 1 as the antenna plate, and it can be clearly seen in Fig. 5 that the solder 13-2 may be considered to be *against the antenna plate.*

4. Applicant further argues it is not possible to make the length of the central conductor smaller than a quarter-wavelength for typical signals processed in high frequency applications because the central conductor is extending through three different substrates. The applicant has not provided convincing arguments as to why this is "impossible". It is commonly known in the art that the dimensions of a patch antenna are a quarter wavelength of the operating frequency, and that the dielectric substrate on which the patch antenna sits is generally much smaller than the length and width dimensions of the patch antenna.

5. Applicant also argues that Sekine teaches a coaxial line for connecting the patch antenna with the electronic components, whereas the applicant utilizes a via. The claim language refers to only a "metal passage," which clearly can encompass a coaxial line. Furthermore, the plan definition of "via" is also synonymous with passage. Therefore, claim 10, which cites "a metal via" is not substantially different from "a metal passage" cited in claim 1. Applicant further differentiates claim 10 by citing an antenna printed circuit board versus an antenna plate. This overcomes the reference Sekine because the antenna plate (1, Fig. 1) of Sekine is defined as an electrically conductive base plate. Printed circuit boards are primarily comprised of dielectric materials, and therefore, the electrically conductive plate (1, Fig. 1) would not generally be interpreted as a PCB. Therefore, claims 10-16 have been rejected under Tsai (US 6,846,834) as discussed below.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekine (EP 0 978 729 A2 -- cited by Applicant).

As to claims 1, Sekine teaches a device comprising a patch antenna (7, Fig. 1) processing a signal, and coupling means (6, Fig. 1) for connecting the antenna to an electronic component (4, Fig. 1), wherein the patch antenna is arranged on a first side of an antenna plate (1, Fig. 1)

wherein the electronic component can be mounted on a second side of the antenna plate and wherein the coupling means comprise a metal passage (6, Fig. 1) through the antenna plate which transposes into a bond pad (13-2, Fig. 5) against the antenna plate on the second side, and a metal bond wire (11, Fig. 1) between the electronic component and the bond pad.

Sekine does not explicitly teach the length of the passage, as seen perpendicularly of the antenna plate, is smaller than a quarter-wavelength of a signal to be processed by the antenna.

As to claims 2, Sekine further does not teach the length of the bond wire is smaller than a quarter-wavelength of the signal to be processed by the antenna.

However, it would have been obvious to one of ordinary skill in the art to make the length of the via significantly smaller than a quarter-wavelength of the signal to be processed so that that via does not contribute substantially to the operating frequency of the antenna device. It is well known in the art that the physical length of a radiating conductor determines the operating frequency of the radiating conductor, and it is preferable that the lengths of the connections between the radiating conductor and the electronic components be negligible in comparison to the size of the radiating conductor and to minimize signal loss.

As to claims 3, Sekine teaches an electrically conductive plate (5, Fig. 1) for the patch antenna is arranged against the second side of the antenna plate, wherein the electrically conductive plate is provided with a recess for the passage.

As to claims 4, Sekine does not explicitly teach the electronic component is a low noise amplifier, but teaches the electronic component is a semiconductor chip or a transmitter-receiver. Sekine further teaches that the transmitter-receiver comprises an amplifier [0010], but does not explicitly teach a low noise amplifier. It would have been obvious to one of ordinary skill in the

art that the electronic component would comprise a low noise amplifier because low-noise amplifiers are well known in the art of communication systems to amplify signals received by an antenna, and are often located close to the antenna to minimize signal loss.

As to claims 6, Sekine teaches the passage has a substantially cylindrical form (6, Fig. 5).

As to claims 7, Sekine teaches on the side of the antenna the passage makes direct contact with a power supply line (12, Fig. 1) of the patch antenna

As to claims 8, Sekine teaches the periphery of the passage substantially corresponds with the width of the power supply line.

As to claim 9, Sekine teaches a radar receiver ("high-frequency transmitter-receiver," abstract) provided with a device as claimed in claim 1.

8. Claims 10-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai (US 6,486,834).

Tsai teaches a device comprising an antenna processing a high frequency signal and coupling means for connecting the antenna to an electronic component (162, Fig. 1), wherein the antenna is arranged on a first side (221, Fig. 1) of an antenna printed circuit board (22, Fig. 1), wherein the electronic component can be mounted on a second side (223, Fig. 1) of the antenna PCB, wherein the coupling means comprises a metal via (222, Fig. 1) through the antenna PCB which transposes into a bond pad (284, Fig. 3) against the antenna PCB on the second side, and a metal bond wire (connection between 284 and 262, Fig. 3) between the electronic component and the bond pad, wherein the length of the via as seen perpendicularly of the antenna PCB is smaller than a quarter-wavelength of the signal to be processed by the antenna.

Tsai does not teach a patch antenna but rather a meandering line antenna as shown in Fig. 1. The claim would have been obvious because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Tsai further does not explicitly teach the length of the via is smaller than a quarter-wavelength of the signal to be processed by the antenna. Tsai does however teach that the antenna configuration is useful for frequency bands between 2.25 to 2.73 GHz (Figs. 5 and 6) and that the height of the PCB is 0.8mm (col. 2, line 18). Therefore, it is clear that the length of the via is significantly smaller than a quarter-wavelength of the signal to be processed (approximately 30 mm) by the antenna.

As to claim 11, Tsai teaches an electrically conductive plate (26, Fig. 2) for the patch antenna is arranged against the second side of the PCB, wherein the electrically conductive plate is provided with a recess for the via, such that the electrically conductive plate forms a ground plane for the antenna ("ground shield 284 connects with the metal sheet 26," col. 42-43).

As to claim 12, Tsai does not explicitly teachethe length of the bond wire is smaller than a quarter wavelength of the signal to be processed by the antenna. However, it is clear that the bond wire is much smaller than the length of the PCB (26 mm, col. 2, line 18), and the antenna may be utilized in high frequencies between 2.25 to 2.73 GHz (Figs. 5 and 6). It can therefore be inferred that the bond wire is smaller than a quarter wavelength of the signal to be processed by the antenna.

As to claim 13, Tsai does not teach the electronic component is a low noise amplifier. However, low noise amplifiers are well known in the art and are commonly placed as close to the antenna element as possible to minimize signal loss.

As to claim 14, Tsai teaches the via has a substantially cylindrical form.

As to claim 15, Tsai teaches on the side of the antenna the via makes direct contact with a power supply line of the antenna (242, Fig. 1)

As to claim 16, Tsai teaches the periphery of the via substantially corresponds with the width of the power supply line (Fig. 3).

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER F. HU whose telephone number is (571) 270-3831. The examiner can normally be reached on Monday-Friday 9:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas Owens can be reached on (571) 272-1662. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JENNIFER F HU/
Examiner, Art Unit 2821

/Douglas W Owens/
Supervisory Patent Examiner, Art Unit 2821
February 28, 2010